Journal of Research on the Lepidoptera 21(4): 255-269, 1982(83)

Commentary on Miller and Brown vs. Ehrlich and Murphy *et al.*: Pluralism in Systematics and the World-wide Nature of Kinship Groups

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Introduction

The Journal of Research on the Lepidoptera has invited comment on Ehrlich and Murphy's (1982) critique of and counterproposal to the nomenclature proposed by Miller and Brown (1981) for the butterflies of North America north of Mexico. Ehrlich has published significantly on taxonomic characters and the higher classification of butterflies (Ehrlich, 1958) and has also co-edited a popular guide to North American butterflies utilizing a nomenclature different from that proposed by Miller and Brown (Ehrlich and Ehrlich, 1961). Ehrlich and Murphy, citing in their acknowledgments the support of some fifty professional and amateur lepidopterists, take particular exception to the number of new generic names introduced in binomial combinations by Miller and Brown. They go beyond suggesting these new combinations be ignored, and propose a standardization of common usage for binomials based on another work, that of Howe (1975).

Ehrlich and Murphy's critique is derived from and characterized by certain concepts and methodological viewpoints. Therefore, it is important that lepidopterists (especially systematists and biogeographers) scrutinize the validity and comprehensiveness of their arguments to determine whether their proposals are appropriate and acceptable. Without scrutiny from diverse points of view, particular arguments may seem persuasive, but actually lack the comprehensiveness needed to arbitrate the kind of controversy that has occurred since the publication of Miller and Brown.

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Underlying our particular response are two points of reference quite different from those of Ehrlich and Murphy. Their primary concern is the stability of nomenclature in one group of insects (butterflies) on part of one continent (North America north of Mexico). As persons with professional training specialized in systematics and with study groups characterized by worldwide distributions, our inclination is toward studying Lepidoptera taxonomy within the context of systematics as a whole, and with a view of North American Lepidoptera as one component of worldwide patterns of distribution and kinship.

Areas for Discussion

We suggest four areas of discussion, each of which will be examined in separate sections under the following headings with illustrations and examples provided:

(1). "Appropriate Arbitration"—Can the controversy concerning a preferred nomenclature for North American butterflies be arbitrated and, if so, are Ehrlich and Murphy appropriate arbiters?

(2). "Pluralism in Systematics"—Are the arguments and proposals of Ehrlich and Murphy congruent with contemporaneous systematic theories?

(3). "The Worldwide Nature of Kinship Groups"—If continents are single components of worldwide patterns of distribution and kinship, must nomenclature include recognition of those patterns?

(4). "Practical Problems"—Do the proposals of Ehrlich and Murphy have practical problems, especially the possibility of inadvertant suppression of alternative points of view?

The above-mentioned areas of discussion are suggested because of an overall problem we perceive in the presentation by Ehrlich and Murphy: that areas of probable general agreement also inherently contain severe problems of specific interpretation. Ehrlich and Murphy make several major points with which we think most systematists would agree and which have probably attracted broadest support. It may be less apparent, however, that matters of language and interpretation in these views lead almost inevitably to serious divergences of opinion depending on the particular theoretical preferences of researchers.

For example, significant points are strongly voiced by Ehrlich and Murphy (pp. 4-7), particularly their observation that problems could ensue if part of the professional and amateur community adopt Miller and Brown's nomenclature while others retain that of Howe or some other author. Nearly all systematists would agree that new combinations or changes of status introduced in checklists or popular works should be based upon properly documented revisionary works. Changes of status or combinations without proper data and arguments, or even including the latter but encompassing only one or a few taxa of a group, introduce potentially serious synonymic problems into the scientific literature. Most

specialists would also agree with Ehrlich and Murphy that proliferation of new generic names in binomial combinations is probably less preferable than possible alternatives. However, there exists a diversity of opinion concerning what constitutes competence in taxonomic works and the various methodologies for producing them. Similarly, when Ehrlich and Murphy cite particular examples of combinations and groupings of taxa in North America in relation to their own theoretical preferences concerning taxonomic and geographic convenience (pp. 2-4), they also elicit potential controversy in methodological interpretation. Since the problem of generic group names is the crux of the issue addressed by Ehrlich and Murphy, we have arranged our entries in a format which addresses this problem.

Appropriate Arbitration.

After establishing that a controversy exists concerning North American butterfly nomenclature, Ehrlich and Murphy take two actions which, in effect, propose that they be potential arbiters. Firstly, they suggest that a preferred nomenclature (Howe, *loc. cit.*) might be chosen [through the Lepidopterists Society], explain how this standardization would be enforced, and provide details concerning criteria and exceptions that could be allowed. Secondly, they offer scientific arguments drawn from their particular theoretical preferences in systematics and biogeography, support adoption of a nomenclature similar to that authored in Ehrlich and Ehrlich (*loc. cit.*) and cite other work of Ehrlich (*loc. cit.*) as corroboration for the appropriateness of their view.

Inquiry concerning whether other considerations, implications, or possible consequences may render a standardized nomenclature undesirable, or whether the surrounding controversy can be appropriately arbitrated, are not the primary concern of their paper. Such consideration has been aided by the actions of editors of *The Journal of Research on the Lepidoptera* in inviting comment. In our view, the most important problem concerning possible arbitration of the controversy is whether any point of reference among possible opinions is sufficiently broad to be considered appropriate. Within this context, the worthiness of Ehrlich and Murphy's arguments should be considered.

Pluralism in Systematics.

Pluralism refers to the existence of many and diverse points of view and allows for the possibility that each might be valid. We believe it is inevitable that there will be strong differences of opinion in systematic theory and that many points of view will be argued as "scientifically" the "best" or most preferable. The case arises because systematic theories and methodologies begin with certain assumptions and develop the logic of technique, argument, and inference from them. Table 1 reviews some of

the basic, but very different, kinds of assumptions and generalizations preferred by the three most widely pursued schools of systematic theory. It seems not only inevitable that these differences will remain, but that the taxonomic results of each of these methodologies will contribute different groupings of taxa that will be incorporated into checklists and popular works.

Though the topic of systematic theory and methodology is vast, three particular areas deserve mention in relation to the issues addressed by Ehrlich and Murphy.

(a). *Divergent Theories and Methods in Systematics*—Relevant to the discussion of Ehrlich and Murphy is that among the three schools listed in Table 1 there is little agreement concerning basics—criteria for species and genera, validity of biologically defined or investigated taxa, criteria for placing taxa into groups, the nature of relatedness (kinship or similarity) [see below], the relation of kinship to a classification, the relation of nomenclature to a classification, the relation of systematics to spatial (biogeographic) considerations, and stability.

(b). *Different Concepts of Relatedness*—The function of each of the methodologies listed in Table 1 is to group organisms in appropriate ways, a concern also voiced by Ehrlich and Murphy. The argument between the schools, like the argument between Ehrlich and Murphy vs. Miller and Brown, concerns which way of grouping is "better". One standard of "better", that of "relative monophyly", is examined to a limited degree in Table 2 (see Schuh and Polhemus, 1980 and Sneath and Sokal, 1973, for different technical opinions on systematic methods and evaluations of the importance of monophyly). Both Miller and Brown, in the introduction to their checklist, and Ehrlich and Murphy, in their arguments, cite the importance of monophyly and their emphasis on this criterion in preparing their works. Monophyly concerns which grouping of taxa actually contains the most related of organisms.[2] However, "relatedness" is not defined identically by the various schools of systematics. It is a matter of opinion whether "relatedness" implies a relationship of "similarity" (most alike in taxonomic characters) or a phylogenetic relationship (a relationship of kinship, that is, descendants of an immediate common ancestor). Regardless of this problem, the grouping of kinds of organisms from one continent alone will inevitably lead to unrelatedness in the grouping if more immediately related groups occur on other continents.

Table 2 shows that, when one of the groups cited by Ehrlich and Murphy as an example of the problem of taxonomic convenience (*Callophrys sens. lat.*, p. 3), is analyzed by different systematic methods, and includes patterns of most immediate kin on continents other than North America,

[2]Because of differences in the concept of "relatedness" we have not chosen to quote any particular rigorous definition of monophyly. Such could be located in the methodological papers cited in this paper or in the standard texts of the schools of systematic theory.

TABLE 1. SCHOOLS OF SYSTEMATIC THEORY

Features	Evolutionary	Phenetic	Phylogenetic
Well known founders/proponents	Simpson, Mayr *et al.*	Sokal, Sneath *et al.*	Hennig *et al.*
Commonly known as—	"traditional taxonomy"	"numerical taxonomy"	"cladistics"
View of ancestors	can be recognized, only sometimes hypothetical	can be recognized	cannot be recognized, hypothetical only
View of speciation	allopatric speciation and phyletic gradualism	phylogeny viewed as unrecoverable	allopatric speciation not phyletic gradualism
General method of grouping taxa	weighted similarity	equally weighted similarity	shared unique characters (derived characters)
View of monophyly	taxa need not be precisely monophyletic	phylogeny irrelevant as criterion for grouping	must be precisely monophyletic
Relation of phylogeny to classification	phylogeny not necessarily to be retrievable from classification	phylogeny irrelevant	phylogeny must be retrievable from classification
View of utility of classification	to express divergence or phylogeny	usefulness and convenience	to express hypothetical phylogeny
Name of branching diagram	evolutionary tree	phenogram	cladogram
View of relation of classification to distribution (geographic)	none necessarily	none	expected to correlate with allopatry
Preferred biogeographical school of theory	dispersal biogeography	dispersal biogeography	vicariance biogeography
View of subspecies	relevant	relevant	irrelevant
View of biological species definition	conceptual and methodological tool	conceptual and methodological tool	conceptual tool only
View of tests of reproductive compatibility (see above)	relevant	relevant	irrelevant
Common catch words	divergence, distance, adaptive zones, weight, gradualism, gradism, tree, biological species, etc.	OTU, similarity, convenience, distance, biological species, biological investigations, etc.	apomorphy, plesiomorphy, clade, splitting events, polarity, monophyly, rank, etc.
General time period	1940-	1960-	1970-
Contribution of groupings to current checklists (butterflies)	circa 90%	circa 10%	circa 2%

monophyly is difficult to assess equitably. According to the assessment of the cladistic methodology, in the case of Callophryina[3], Miller and Brown's classification appears superior, containing nine monophyletic groups and three "paraphyletic" groups (groups in which only one unrelated taxon has been included by mistake[4]). Howe's classification for the same group, preferred by Ehrlich and Murphy, is (except for genera containing only one species) entirely "polyphyletic" (made of groups all having more than one

[3]Genera listed in Table 2 comprise one monophyletic assemblage defined as an infratribe "Callophyrina" within the Tribe Eumaeini (sensu Eliot, 1975) according to Johnson, 1981. See footnotes and explanation of Table 2 for comments on the limitations of these data.

[4]For particular rigorous definitions and discussion of monophyly, paraphyly, and polyphyly see Nelson, 1971; Ashlock, 1971.

Table 2. NOMENCLATURE AND MONOPHYLY

North American vs. Worldwide

Taxonomic Rudiments of an Intercontinental Kinship Group

Components:

Taxon	Assessment of Relative Monophyly by Cladistic Analysis			Name and Location of Most Immediate Kinship Group
	Howe	**Miller/Brown**	**Cladistic**	
Incisalia sens. strict.	polyphyletic	monophyletic	monophyletic	new genus, China
Incisalia sens. lat.	polyphyletic	paraphyletic	monophyletic	new genus, South America (A) *Satsuma***, China (P)
Mitoura sens. strict.	polyphyletic	monophyletic	monophyletic	*Callophrys*, North America-Eurasia
Mitoura sens. lat.	polyphyletic	monophyletic	monophyletic	*Callophyrs*, North America-Eurasia
Callophrys sens. strict.	polyphyletic	monophyletic*	monophyletic	*Mitoura*, North America
Callophrys sens. lat.	polyphyletic	monophyletic*	monophyletic	*Mitoura*, North America
*Satsuma*** sens. strict.	left out arbitrarily	left out arbitrarily	monophyletic	*Sandia*, North America
*Satsuma*** sens. lat.	left out arbitrarily	left out arbitrarily	monophyletic	*Sandia*, North America; newgenus, Andes, South America
Cyanophrys sens. strict.	polyphyletic	paraphyletic	monophyletic	new genus, South America
Cyanophrys sens. lat.	polyphyletic	paraphyletic	monophyletic	*Sandia*, Central & South America; new genus, South America
Sandia sens. strict.	monotypic in polyphyletic assemblage	monotypic monophyletic	monophyletic	new genus, South America
Sandia sens. lat.	monotypic in polyphyletic assemblage	monotypic monophyletic	monophyletic	new genus, South America
Xamia sens. strict.	monotypic in polyphyletic assemblage	monotypic monophyletic	synonymized with *Sandia*	new genus, South America
Xamia sens. lat.	monotypic in polyphyletic assemblage	monotypic monophyletic	synonymized with *Sandia*	new genus, South America
culminicola Group, of *Thecla**** sens. strict.	left out arbitrarily	left out arbitrarily****	monophyletic	*Satsuma***, China
culminicola Group, of *Thecla**** sens. lat.	left out arbitrarily	left out aritrarily****	monophyletic	*Satsuma***, China
new North American genera	0	0	0	
new Eurasian genera	——	——	3	new genus, Central America; *Incisalia* sens. strict., North America
new Central & South American genera	——	——	4	new genus, South America; *Cyanophrys* sens. strict. and sens. lat., Central & South America; *Satsuma***, China

We use sens. strict. to refer to the immediate kinship group (clade) of the type species; we use sens. lat. to refer to the remaining assemblages within the genus which may be one (part of a paraphyletic assemblage) or more than one (part of a polyphyletic assemblage).

*We allow that the well known Eurasian taxa are left out by the arbitrary nature of the checklist.

**_Satsuma_ = _Ginzia_

***Draudt, in Seitz (1919)

****Brown (1942) noted that this group was probably in the same overall monophyletic assemblage as North American _Incisalia_ sens. lat.

In assemblages made up of three groups it is of interest to note which relation is apotypic (A)—most immediate kinship group with relatively more-derived characters—and which is plesiotypic (P)—most immediate kinship group with relatively more-primitive characters.

Table 2. Summarizes monophyly as assessed by one particular cladistic analysis (Johnson, 1981) compared to classifications in Howe (1975) and Miller and Brown (1981) for taxonomic components of the "_Callophrys_" _sens. lat._ as described in the text. The following qualifications are important to understanding the nature and limitations of the comparison. If the intercontinental kinship relations of this particular study group show either Miller and Brown's or Howe's classification to be more or less monophyletic in comparison, it may result A) simply from chance alone since both continentally restricted classifications are arbitrary to that extent or B) because arbitrarily using separate genera (but not monotypic ones) instead of clusters of subgenera within one genus is less prone to para- or polyphyly, since if some groups are actually more immediately related to components on another continent, they are free to be associated without contradicting a pre-existing arbitrary subgrouping. As a cladistic study the relationships posited represent a hypothesis of kinship relations and are open to claims of counter-evidence or refutation by other alternative cladistic interpretations, use of another method, refutation of the interpretation of characters or character states, implications of additional characters, implications of additional taxa, and/or implications of additional distributional data. The hypothesis indicated by our interpretation (our cladogram) is supported by the least contradictory interpretation of several hundred characters and character states in just over two hundred taxa distributed on five continents and two additional subregions. It does not, therefore, claim to be "right", but simply one hypothesis of relationships derived from the data.

unrelated group mistakenly included and of which none are most directly related to each other[4]).

Another researcher (James Miller, pers. comm.), also using the cladistic methodology as a point of reference regarding the genus _Papilio_ on a worldwide basis (Ehrlich and Murphy, pp. 6-7), offers a different point of view. Although he does not think Howe cites characters appropriate to erecting genera or monophyletic groups, at face value the Howe classification contains more monophyletic unity than that of Miller and Brown. The point demonstrated by these two examples is that not only is the criterion "better" difficult to equitably assess among lists of purportedly related species, its assessment depends on rather arbitrary points of view. The footnotes and explanation of Table 2 explain to some degree the particular

arbitrary assumptions and definitions used by us to cladistically evaluate the groupings preferred by the other authors. To the extent that a preferred nomenclature for one continent would tend to favor one such arbitrary concept of relatedness, we pursue a discussion of the frequency of intercontinental relations of North American butterflies in the next entry.

Another comment is relevant to the question of defining relatedness. It regards the extent to which lepidopterists infer actual phylogenetic (kinship) relationships between taxa based on their order in checklists. If lepidopterists view these groupings, or their linear order, as implying estimations of kinship relations, creation of a preferred nomenclature for one continent will create some indeterminate number of spurious groupings. On the other hand, if lepidopterists do not imply any kind of relatedness to such groupings one has to question why a controversy exists over groupings at all. Regarding the above observation it might be best if such listings were alphabetical or chronological according to dates of description. The phenetic school of systematic methodology prefers that no claim of phylogenetic relationship be a requirement for grouping itself (see Cracraft, 1974). The interest of Ehrlich and Murphy in convenience is probably based on this view, as opposed to other systematic positions which view convenience as secondary in importance to attempts to define natural (e.g. kinship related) groups (see Nelson, 1970, and Colless, 1967, 1969).

(c). *Different Views on Generic Splitting*—Unfortunately, the views concerning formation of generic level taxa differ. Figure 1 illustrates this point relative to a paper by Clench (1978) and another opinion formulated by us for the sake of example. Clench, using a concept of relatedness based on simlarity, concluded that the taxa listed in Figure 1 are so similar that they can best be represented as belonging to one named group. This concept of similarity as a criterion for grouping is called a "grade". Clench concluded that the relations of these taxa are best expressed as one grade. If, however, hypotheses of kinship ("clades") are preferred over grades as a measure of relatedness, another worker would prefer that all the names be available so that the most informative branching diagram can be constructed for kinship relations within the group. The point demonstrated is that any decisions concerning lumping or splitting genera are purely arbitrary, depending on theoretical preference.

The Worldwide Nature of Kinship Groups.

Table 2 summarizes the genera recognized by various authors in regard to the "*Incisalia-Callophrys*" "disagreement" cited by Ehrlich and Murphy (p. 3). The worldwide components of the group belong to one infratribe (Callophryina, *sensu* Johnson, *loc. cit.*) within the lycaenid tribe Eumaeini. Since we can only use published names for the groups we have

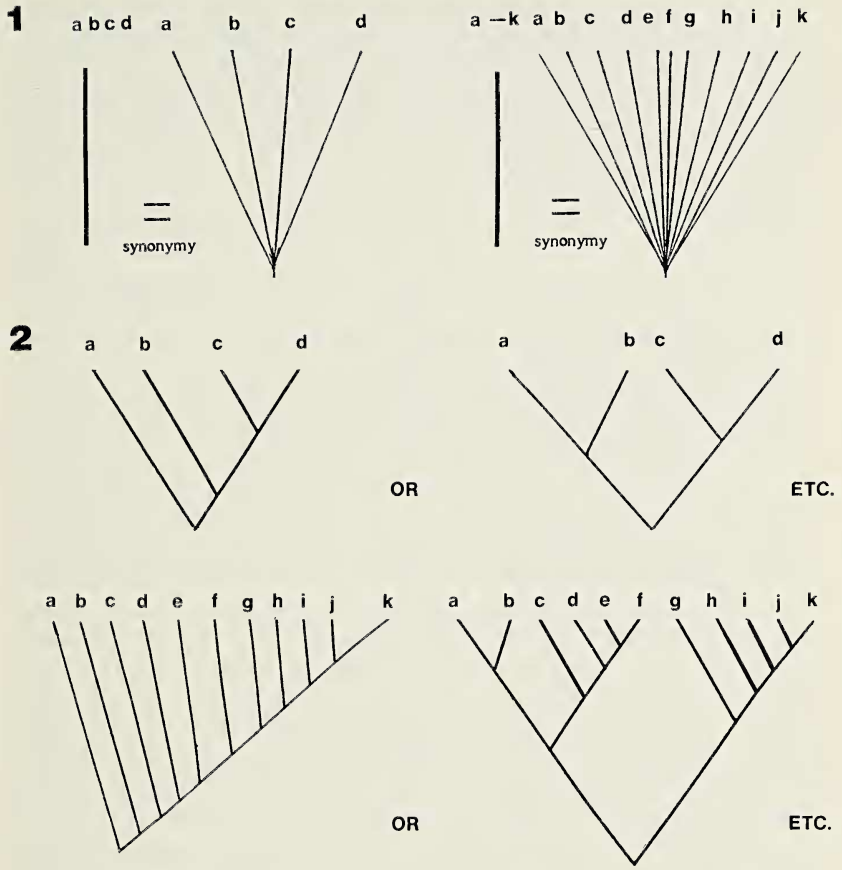


Fig. 1. Holarctic hairstreak genera viewed as a grade (1) and as clades (2). Though genera synonymized by Clench (1978) are acknowledgably similar, phylogenetic inference and retrievability are influenced by the lumping (1) or splitting (2) according to theoretical preference. In (1) lumping to one grade implies the components are retrievable as only one lineage. Maintenance of all the names (2) allows multiple expressions of phylogenetic components upon further analysis. (1) According to Clench *Fixsenia* (a) = *Strymonidia* (b) = *Euristrymon* (c) = *Thecla, Nordmannia,* etc. of authors, in part (d) (left) and *Satyrium* (a) = *Callipsyche* (b) = *Neolycaena* (c) = *Nordmannia* (d) = *Chattendenia* (e) = *Tuttiola* (f) = *Superflua* (g) = *Pseudothecla* (h) = *Bakeria* (i) = *Necovatia* (j) = *Thecla, Strymon, Strymonidia* etc. of authors, in part (k) (right). (2) If the above names are not synonymized but left to be used as subgroupings of the oldest names available (*Fixsenia/Satyrium*) phylogenetic retrieval of the subgroupings is facilitated (above and below, respectively, as two of many possibilities).

chosen the terms *sensu stricto* and *sensu lato* (as defined at the base of Table 2) to acknowledge additional components within each of the taxa listed in the left hand column of the Table. If certain taxa defined by exclusive North American criteria are either para- or polyphyletic[4] in an intercontinental context, it will be of interest to show to what non-North American components these groups are most closely related (right hand column in the Table).

An examination of Table 2 shows that within the intercontinental group studied, numerous groups actually have closer relatives on another continent. Whereas most lepidopterists are aware of European-North American relations (e.g. North American *Callophrys* always has been known to have related species in Europe), western North American-Asian relations are less well known. In the case of several groups in Table 2, western North American-Chinese relations are evident and have further components in western Central America and western South America.

When North America is considered alone, *Incisalia* seems like a homogeneous group of "brown elfins with mottled brown undersides". Actually the kinship components (here called *Incisalia sensu stricto* for the gymnosperm-feeders related to the type species, and *Incisalia sensu lato* for the angiosperm-feeders) each have their closest relative in China. The "genus" *Cyanophrys*, including the species *goodsoni* and *miserabilis*, happens (like Ehrlich and Murphy's example of *Pieris brassicae*) to have a type species that is the most morphologically specialized within its group. This inevitably restricts the use of *Cyanophrys* as a category. An additional problem arises because the genus was created by Clench for the sake of its North American novelties. Clench never listed what was to be included in *Cyanophrys*. We mention this not to fault Clench, but to illustrate that the creation of a new genus, *Cyanophrys*, for the sake of a few apparently unique North American butterflies, could not by nature anticipate that upon further analysis it would prove to be a polyphyletic assemblage. Study of morphology beyond that of wing characters, summarized in Table 2, indicates that taxa often placed with *Cyanophrys*, through association with its type species and North American representatives, actually include one group akin to *Sandia*, another very primitive group (including *goodsoni*) with kin in China, some kin in South America, and the more familiar "blue above and green beneath" hairstreaks of South and Central America which indeed can be grouped with *Cyanophrys sensu stricto*.

Table 2 also contains examples of genera described to include single North American species (*Xamia* and *Sandia*), disregarding the place of occurrence of their nearest relative, namely *Xamia* in Guatemala and *Sandia* in numerous parts of Central and South America. As long as North America is considered in isolation, both *Xamia* and *Sandia* are obvious "uniques" and considered worthy of subgeneric (Howe) or generic rank (Miller and Brown). Within their intercontinental kinship group, however,

they belong to a broader generic level assemblage which is recognized only by considerable fragmentation of presently accepted classifications.

The data set examined in Table 2 suggests rudiments of what may be general patterns once additional worldwide groups are studied. It would be unfortunate if progress toward finding general patterns in worldwide phylogenetic and distributional relations, certainly the cornerstone of modern systematics and biogeography, was inadvertantly hampered by certain presuppositions about generic concepts derived from the study of only one region.

Practical Problems.

Several aspects in the proposals of Ehrlich and Murphy suggest practical problems of potentially serious consequence. Their presentation includes specific proposals for establishing a preferred nomenclature for North American butterflies and also commentary on their particular personal preferences in technique and methodology. Both suggestions have practical problems.

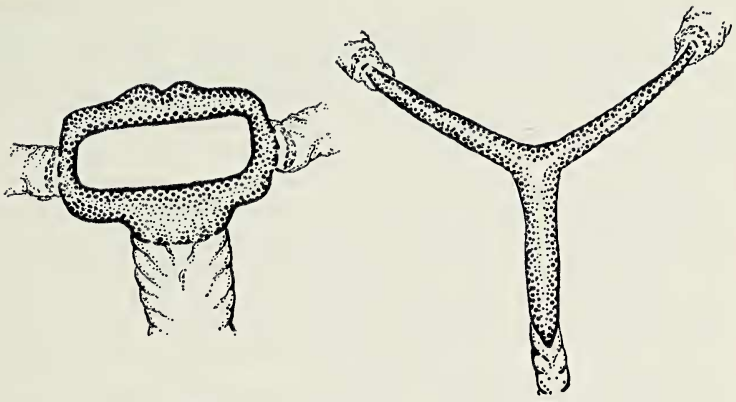
Perusal of Table 1 indicates other causes for concern, among them the problem of evaluating biological species and the differences of opinion concerning the kinds of testing for these. Two schools (phenetic and evolutionary) accept tests of reproductive compatibility as relevant to their methods; another (cladistics) rejects them *not* as irrelevant to biology, but inconsistent with the kinds of information usable in the method (Rosen, 1979). The frequency of such tests as criteria of specificity in Howe (*loc. cit.*) suggests this is a potential problem. Subspecies represent another problem. Two schools (phenetic and evolutionary) accept them as potentially useful, while the other (cladistic) cannot allow them on methodological grounds alone (Rosen, *loc. cit.*). The critical issue of monophyly is yet another problem. Evolutionary systematics allows paraphyletic groups while cladistics does not, and phylogeny is irrelevant to the main reason for grouping in phenetics.

The most important consideration concerning the above-mentioned problems is determining when exceptions to a preferred nomenclature would be allowed. Ehrlich and Murphy comment briefly that clear demonstrations of polyphyly will be an exception to their rules for encouraging editors and reviewers to "routinely reject any work that suggests generic name changes from those in Howe" (p. 8). Detailed demonstrations of polyphyly, aside from theoretical differences concerning their definition, usually are presented in lengthy revisionary works published by monograph series and research institutions. Such demonstrations are less apt to appear in the shorter studies usually published by society supported journals. Since Ehrlich and Murphy suggest that their rule would be instituted by legislation through the Lepidopterists Society a predicament is created for busy editors and reviewers. They would be required to

consult source material for nomenclatures used or cited which are at variance with the standardized classification. This kind of discretion would require not only ready access to recent sources (not always possible), but training contemporary enough to allow fair assessment of the theories and methodologies from which the proposed nomenclature was derived. The latter may be circumstantially impossible for a researcher whose training is not in systematics, but in some related field of biology. In such cases "routine rejection" may overcome fairness since ignoring the new nomenclature causes neither controversy nor introduces into that society's journal an unfamiliar classification. An extreme result of such practices could be the development of two nomenclatures for North American butterflies—one preferred as convenient by the lepidopterists and another (open to change) of interest to systematists and biogeographers whose main concerns are systematic theory and spatial patterns transcending single continents. The latter situation has the same unfortunate consequence Ehrlich and Murpy seek to avoid by establishing Howe as a preferred nomenclature to Miller and Brown.

There are examples of how "accepted" classifications have led to repression of another author's work. The particular example we cite also addresses Ehrlich and Murphy's comments on the value of various characters. Our example concerns the very familiar Neotropical genera *Agrias, Prepona,* and *Anaea* (Nymphalidae) and the work of A. H. B. Rydon. These three genera are examples of "sacro-sanct" taxa which are generally assumed by lepidopterists to be monophyletic. They are also groups in which the female genitalia have only recently been studied (Johnson and Descimon, in prep.). It is important to note that very few studies of female genitalia (and many other important morphological characters, e.g. palpi, antennae, facial features, integumental androconia, etc.) have been made for North American butterflies. It is obvious that in the intercontinental study of Lepidoptera, components in less studied geographic regions will initially require the most fundamental taxonomic techniques ("alpha taxonomy" *sensu* Mayr, Linsley, and Usinger, 1953). It is unreasonable, therefore, that workers on one continent suggest limiting the use of certain fundamental morphological structures in regard to new groupings of taxa.

Figure 2 illustrates the occurrence of two very different configurations of the female genital plate in *Agrias, Prepona* and *Anaea.* These structures would lead almost any systematist to question whether these genera as presently defined could be monophyletic. A cladist would expect that one branching diagram be able to contain a hierarchy of these variants (along with those of other characters) with minimum contradiction. Such a branching diagram of monophyletic groups in this assemblage would require the erection of more genera if any of the groups are polyphyletic (which at least two seem to be, the other being paraphyletic). In 1961, A.



	1	2
AGRIAS	X	X
ANAEA	X	X
PREPONA	X	X

Fig. 2. Basic configurations of the female genital plate and their occurrence in *Agrias, Prepona,* and *Anaea* as defined by Comstock, 1961, and Seitz, 1919. Distribution of two very different configurations in the three "genera" indicates none are monophyletic, an observation corroborated by characters of the larvae (Rydon, 1971).

H. B. Rydon noticed the problem in these genera from characters in the larvae. He noted that drawings of Neotropical larvae by Ms. Margaret Fountaine and the Rev. Miles Moss in the library of the British Museum (Natural History) showed very obvious differences seeming to occur at random within Comstock's (1961) definitions of *Anaea* and its "subgenera." Rydon's conclusion was that *Anaea* could not be one group, since not only did the two very different character types occur within it, they occurred also in some *Agrias* and some *Prepona.* However, because his observations contradicted the classification of Comstock (based on wing characters and male genitalia) his paper was rejected by several journals upon the advice of reviewers (A. H. B. Rydon, pers. comm.). Much later, 1971, Rydon's paper found its way into a less widely read publication. In this example two evident sources of characters proved important in contradicting generally assumed "truths" about the classification of a group.

Summary and Recommendations

We selected four areas for discussion of the proposals of Ehrlich and

Murphy: the problem of appropriate arbitration, the utility of pluralism in systematic and biogeographical theory, the intercontinental nature of kinship groups, and potential practical problems. These were derived from a careful reading of their critique and commentary on Miller and Brown (*loc. cit.*) and have, we hope, enlarged the context in which the various aspects of the controversy outlined by the Ehrlich and Murphy commentary can be considered by lepidopterists, both professional and amateur. Our criticisms are aimed more at the scientific implications of Ehrlich and Murphy's proposals than at judging the worthiness of their intentions. Many of their comments include generalizations with which many systematists would agree. Specific interpretation of these points, however, leads to inevitable problems which cannot be settled arbitrarily, we think, without undue problems for scientific study in the Lepidoptera. Although current divisiveness regarding nomenclature is unfortuante, the only background upon which any arbitration could take place would be one consistent with the current breadth of scientific pursuits in systematics and biogeography. Consideration of the complexity and theoretical variance in current approaches indicates a common ground for such arbitration is probably not possible. The fact of this complexity and variance, therefore, most likely inhibits value in the kinds of proposals suggested by Ehrlich and Murphy.

Ehrlich and Murphy are to be commended for bringing to the lepidopterists' community a touchstone for discussing current problems of taxonomy in the North American butterflies. Such discussion of the problems regarding scientific study of the North American fauna, especially in context with current approaches in systematic and biogeographic theory, should continue and is relevant to appreciating the historical contribution made by the thorough research provided in Miller and Brown's recent checklist. Journals in the field of Lepidoptera study should devote more emphasis to direct exchange of scientific and theoretical views among researchers. This would not only enhance the quality of work in Lepidoptera systematics but its reputation among systematists and biogeographers.

Acknowledgments. We are grateful to the following colleagues who read drafts of this manuscript and suggested directions for discussion and relevant changes and revisions. Their advice has helped clarify our considerations and concerns: Frederick H. Rindge and Randall T. Schuh (Dept. of Entomology, American Museum of Natural History), James E. Miller (Dept. of Entomology, Cornell University), Henri Descimon (Laboratory of Zoology, University of Marseilles), and Michael Schwartz (Dept. of Biology, City University of New York). We are also grateful to R. H. T. Mattoni, editor of *The Journal of Research on the Lepidoptera* for encouraging this contribution and maintaining correspondence with all of us during its preparation.

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